



1-31-1971

Eatonia No. 12, Jan. 31, 1971

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Recommended Citation

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EATONIA

No. 12

Florida A & M University, Tallahassee

January 31, 1971

The First International Conference on Ephemeroptera was held at Florida A & M University in August of this year. The editors wish to express their pleasure at being able to meet so many of you personally. We also wish to thank those who could not be present for their kind letters of encouragement.

We appreciate very much your continued help in supplying reprints and information for Eatonia. Persons who wish to request Eatonia should write the editor, University P. O. Box 111, Florida A & M University. University and institutional library requests should be addressed to Dr. N. E. Gaymon, Director of Libraries, University P. O. Box 78, Florida A & M University, Tallahassee, Florida 32307.

News and Notes

The First International Conference on Ephemeroptera was held August 17-20, 1970, at Florida A & M University, Tallahassee. When the original idea for the conference was suggested in Moscow, the conference was envisioned as a small meeting with most participants from the U.S.A. To the surprise of the organizers, participants came to the conference from many parts of the world including Australia and South Africa. While it is hard for me as chairman of the conference to determine the success of the meeting, it appeared that all participants enjoyed the chance to meet together and participate in lively discussions.

Dr. Jay R. Traver was made honorary chairman of the conference. During opening ceremonies she was presented with a plaque recognizing her achievements in the study of Ephemeroptera and a key to the city of Tallahassee. Dr. Traver indicated great pleasure in meeting for the first time workers she has written for many years.

The daytime hours were spent giving formal papers with ample time for discussion after each paper. One afternoon was spent on a symposium on the phylogeny and higher classification of the Ephemeroptera. Evenings were

devoted to informal discussions. One evening a discussion was held on approaches and methods of studying phylogeny and classification. On this occasion, the ideas of two aquatic entomologists not specializing in Ephemeroptera, Prof. Dr. Lars Brundin and Dr. Herbert Ross, were a valuable contribution to the discussion. Another afternoon was spent at Wakulla Springs where the native, semi-tropical environment of northern Florida has been preserved in its natural state. An outdoor fish fry followed this trip. On the last night of the conference, the President of Florida A & M University, Dr. B. L. Perry, Jr., presented a banquet for all participants. Dr. H. C. Alexander, Vice-president of Student Affairs, served as host.

Following the conference many participants traveled by bus on a three day post-conference trip to Northwestern Florida. At the Blackwater River they were able to collect many unique, sand-bottom species of Ephemeroptera. Another day was spent on the Gulf of Mexico where participants could swim or relax on the beach.

Publication of the proceedings of the conference is planned and will include formal papers and discussion. Editing of these proceedings has begun and I hope that they will appear in the spring of 1971.

The Second International Conference on Ephemeroptera will be held in Germany in 1974.

- William L. Peters

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Several papers on the Ephemeroptera were given at the national meetings of the Entomological Society of America held in Miami Beach, November 30-December 3, 1970. A symposium on aquatic insects chaired by A. R. Gaufin included the following papers which presented data on mayflies: Impoundments as a source of pollution, by W. L. Hilsenhoff; Effect of temperature on species diversity of mountain streams below high dams, by G. F. Edmunds, Jr.; The influence of substrate on the distribution and abundance of aquatic insects, by K. W. Cummins; Influence of environmental factors on downstream drift, by N. H. Anderson; and Environmental requirements of aquatic insects, by A. R. Gaufin. The one submitted paper was: The significance of the egg stage to taxonomic and phylogenetic studies of the Ephemeroptera, by R. W. Koss and G. F. Edmunds, Jr.

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A Supplementary Note to the Bibliography of Ephemeroptera
Papers of Dr. O. A. Tshernova

In Eatonia #3 (1956), Dr. Demoulin gave a bibliography of Tshernova's papers from 1928-1952. This bibliography is not complete, and the following titles should be added. All mayfly articles published by Tshernova after

EATONIA

A NEWSLETTER FOR EPHEMEROPTERISTS

Prepared by the S. H. Coleman Library, Florida A & M University

in cooperation with

School of Agriculture and Home Economics, Florida A & M University

Department of Biology, University of Utah

Janice G. Peters - - - - - Editor
William L. Peters and George F. Edmunds, Jr. - Editorial Committee

1956 are quoted in other Eatonia issues.

1928. Neue Ephemeropteren aus Russland. - Zoologischer Anzeiger 75, pp. 319-323, 3 figs. (in German).
1931. Beiträge zur Kenntnis der paläarktischen Ephemeropteren. I. - Zoologischer Anzeiger 92, pp. 214-218, 4 figs. (in German).
1940. Podenki (Ephemeroptera). - in: Zhadin, V. J. (ed.), Zhizn'j Presnich vod SSSR [Freshwater Life in the USSR]. Akademia Nauk SSSR, Moscow-Leningrad. pp. 127-137, 36 figs. (in Russian).
1941. Podenki sobranie na reke Ili ekspeditsii zoologičeskogo muzeja v. 1937 g. [Ephemeroptera collected on the river Ili by the Moscow Zoological Museum's Expedition]. - Sbornik Trudov Gosudarstvennogo Zoologičeskogo Muzeja 6, pp. 239-244, 10 figs. (in Russian, English summary).
1944. Biologičeskije osobennosti nimf podenok, javljajutshichsja pitshej sterljadi v basseine severnoj Dvini [The biological peculiarities of the nymphs of Ephemeroptera on which sterlets of the Dvina feed]. - Zoologičeskii Zhurnal 23, pp. 216-220. (in Russian, English summary).
1948. Ephemeroptera (Agnatha) - Podenki. - in: Tarinskogo & Plavilščikova (ed.), Opredelitel Nasekomych Evropejskoj Časti SSSR [Keys to the Insects of the European USSR]. Akademia Nauk SSSR, Moscow-Leningrad, pp. 56-63, 12 figs. (in Russian).

- V. Puthz, Schlitz

Recent Ephemeroptera Literature

Compiled by William L. Peters and George F. Edmunds, Jr.

Ali, S. R.

- [1] -1966. Productivity of the bottom fauna of a pond in New Gordon College Campus, Rawalpindi. Pak. J. Sci., 18:202-204, 2 tables.
- [2] -1968. Bottom fauna of the streams and rivers of Hazara District after summer rains. Pak. J. Sci. Ind. Res., 11:208-211, 5 tables.
- [3] -1968. Bottom fauna of the streams of Kohat District and Kurram Agency after winter rains. Pak. J. Sci. Ind. Res., 11:449-454, 5 tables.
- [4] -1968. Bottom fauna of the Korang Stream, Rawalpindi. Pak. J. Sci., 20:266-270, 4 tables.
- [5] -1969. Effects of rains on the bottom fauna of the streams of Rawalpindi and Wah. Pak. J. Forest., 19:227-234, 4 tables.

Atwal, A. S., J. P. Chaudhary & M. Ramzan

- [6] -1969. Studies on the seasonal abundance of insects on light trap at Ludhiana. J. Res. Punjab Agr. Univ., 6, Suppl. 1:186-196.

Baccetti, B., R. Dallai & F. Giusti

- [7] -1969. The spermatozoon of Arthropoda. VI. Ephemeroptera. J. Ultrastruc. Res., 29:343-349, 8 figs.

Bjarnov, N. & J. Thorup

- [8] -1970. A simple method for rearing running-water insects, with some preliminary results. Arch. Hydrobiol., 67:201-209, 4 figs., 1 table.

Classey, E. W.

- [9] -1966. Notes on a small collection of Neuroptera, Ephemeroptera and Trichoptera collected in Madeira in 1966. Bol. Mus. Munic. Funchal, 20(94):46-47.

Clifford, H. F.

- [10] -1970. Variability of linear measurements throughout the life cycle of the mayfly Leptophlebia cupida (Say) (Ephemeroptera: Leptophlebiidae). Pan-Pac. Entomol., 46:98-106, 1 fig., 4 tables.

Craven, R. E. & B. E. Brown

- [11] -1969. Benthic macroinvertebrates of Boomer Lake, Payne County, Oklahoma. Southwest. Natur., 14:221-230, 4 figs., 3 tables.

Demoulin, G.

- [12] -1969. Les Ephéméroptères récoltés par la mission danoise du Noona Dan aux îles Philippines et Bismarck. Entomol. Medd., 37:225-241, 14 figs.
- [13] -1970. Troisième contribution à la connaissance des Ephéméroptères de l'ambre oligocène de la Baltique. Bull. Inst. r. Sci. nat. Belg., 46(2):1-11, 9 figs.

Demoulin (continued)

- [14] -1970. Contribution à l'étude morphologique, systématique et phylogénique des Ephéméroptères jurassiques d'Europe centrale V. Hexagenitidae = Paedeephemeridae (syn. nov.). Bull. Inst. r. Sci. nat. Belg., 46(4):1-8, 2 figs., 1 plate.
- [15] -1970. Contribution à la connaissance des Ephéméroptères du Miocène I. Siphurites explanatus Cockerell. Bull. Inst. r. Sci. nat. Belg., 46(5):1-4, 1 fig.

Elliott, J. M.

- [16] -1970. Diel changes in invertebrate drift and the food of trout Salmo trutta L. J. Fish Biol., 2:161-165, 4 tables.

Filipović, D.

- [17] -1966. [Limnological characteristics of the Lisinski Potok source area on Kopaonik Mountain.] Arhiv Biol. Nauka, Srpsko Biol. Društvo, 18:325-337, 8 figs., 1 table.

Frost, S. W.

- [18] -1970. Light trap collecting compared with general collecting at the Archbold Biological Station. Fla. Entomol., 53:173-177, 1 table.

Garkavi, B. L.

- [19] -1965. K biologii Nematody Tetrameres fissispina parazita domanshinkh utok. [Contribution to the biology of the nematoda Tetrameres fissispina, parasite of domestic ducks.] Helminthologia, 6(1-4):61-63.

Geijskes, D. C.

- [20] -1969. Aanvullingen op de Neuropteroidea van Goeree-Overflakkee. [Supplementary data on the Neuropteroidea of Goeree-Overflakkee.] Entomol. Ber. (Amsterdam), 29:127-130.

Horning, D. S. Jr. & W. F. Barr

- [21] -1970. Insects of Craters of the Moon National Monument Idaho. Univ. Idaho Col. Agr. Misc. Ser., 8:1-118, 8 figs., 1 table.

Hudson, P. L.

- [22] -1970. Quantitative sampling with three benthic dredges. Trans. Amer. Fish. Soc., 99:603-607, 2 figs., 1 table.

Hynes, H. B. N.

- [23] -1970. The ecology of flowing waters in relation to management. J. Water Pollut. Contr. Fed., 42(1):418-424.

Kajak, Z., K. Dusoge & A. Prejs

- [24] -1968. Application of the flotation technique to assessment of absolute numbers of benthos. Ekol. Pol., Ser. A, 16:607-620, 12 tables.

Kamler, E.

- [25] -1969. A comparison of the closed-bottle and flowing-water methods for measurement of respiration in aquatic invertebrates. Pol. Arch. Hydrobiol., 16(29):31-49, 5 figs., 3 tables.

Keiner, A. & J. Ollier

- [26] -1970. Contribution à l'étude écologique et biologique de la rivière de Gapeau (Var). Hydrobiol., 36:189-251, 2 tables, 10 plates, 10 photos.

Kljutschareva, O. A.

- [27] -1963. O skate i sutochnikh vertikalnykh migratsiyakh donnykh bespozvonochnykh Amura. [On downstream and diurnal vertical migrations of benthic invertebrates in the Amur.] Zool. Zh., 42:1601-1612, 1 fig., 4 tables.

Koss, R. W. & G. F. Edmunds, Jr.

- [28] -1970. A new species of Lachlania from New Mexico with notes on the genus (Ephemeroptera: Oligoneuriidae). Proc. Entomol. Soc. Wash., 72:55-65, 19 figs.

Lawson, G. W.

- [29] -1970. Lessons of the Volta - a new man-made lake in Tropical Africa. Biol. Conserv., 2:90-96, 7 figs.

Lehmkuhl, D. M.

- [30] -1970. The life cycle of Rhithrogena morrisoni (Banks) in Western Oregon (Ephemeroptera: Heptageniidae). Pan-Pac. Entomol., 46:124-127, 1 table.

Levanidova, I. M.

- [31] -1970. Ekologiya i zoogeografiya vesnyanok, podenok i rucheinikov rek Kamchatki. [Ecology and zoogeography of Plecoptera, Ephemeroptera and Trichoptera of Kamchatka rivers.] Izv. Tikhookean. Nauch.-Issled. Inst. Ryb. Khoz. Okeanogr., 73:100-114, 5 tables.

Levanidova, I. M. & L. V. Kokhmenko

- [32] -1970. Kolichestvennaya kharakteristika bentosa tekuchikh vodoemov Kamchatki. [Quantitative characteristics of the benthos of running waters of Kamchatka.] Izv. Tikhookean. Nauch.-Issled. Inst. Ryb. Khoz. Okeanogr., 73:88-99, 1 fig., 1 table.

Lewis, D. J., R. H. L. Disney & R. W. Crosskey

- [33] -1969(1968). A new phoretic species of Simulium (Dipt., Simuliidae) from West Cameroon, with taxonomic notes on allied forms. Bull. ent. Res., 59:229-239, 20 figs.

McCafferty, W. P.

- [34] -1970. Neotropical nymphs of the genus Hexagenia (Ephemeroptera: Ephemeridae). J. Georgia Entomol. Soc., 5:224-228, 2 figs.

Müller, K.

- [35] -1970. Die Drift von Insektenlarven in Nord- und Mitteleuropa. Österreichs Fisch., 23:111-117, 8 figs., 1 table.

Müller-Liebenau, I.

- [36] -1970(1969). Revision der europäischen Arten der Gattung Baetis Leach, 1815 (Insecta, Ephemeroptera). Gewässer u. Abwässer, 48/49:1-214, 155 figs.

Odening, K.

- [37] -1969. Der Lebenszyklus von Omphalometra flexuosa (Trematoda: Plagiorchiata). Zool. Anz., 182:342-345, 3 figs.

Pearson, W. D., R. H. Kramer & D. R. Franklin

- [38] -1968. Macroinvertebrates in the Green River below Flaming Gorge Dam, 1964-65 and 1967. Proc. Utah Acad. Sci., Arts Lett., 45:148-167, 2 figs., 4 tables.

Peters, W. L. & G. F. Edmunds, Jr.

- [39] -1970. Revision of the generic classification of the Eastern Hemisphere Leptophlebiidae (Ephemeroptera). Pac. Insects, 12:157-240, 357 figs.

Phillips, D. M.

- [40] -1969. Exceptions to the prevailing pattern of tubules (9 + 9 + 2) in the sperm flagella of certain insect species. J. Cell Biol., 40:28-43, 14 figs.

Prunescu-Arion, E. & M. Baltac

- [41] -1967. Contributii la studiul hidrobiologic al riuului Someşul Cald. [Contribution to the hydrobiological study of the Someşul Cald River.] Hidrobiol. Bucharest, 8:89-98, figs.

Riek, E. F.

- [42] -1970. Ephemeroptera (Mayflies), pp. 224-240, figs. 12.1-12.9, in Waterhouse, D. F., ed., The Insects of Australia. Melbourne Univ. Press. i-xii + 1-1029.

Schwoerbel, J.

- [43] -1964. Die Bedeutung des Hyporheals für die benthische Lebensgemeinschaft der Fliessgewässer. Verh. Internat. Verein. Limnol., 15:215-226, 9 figs.
[44] -1967. Das hyporheische Interstitial als Grenzbiotop zwischen oberirdischem und subterranem Ökosystem und sein Bedeutung für die Primär-Evolution von Kleinsthöhlenbewohnern. Arch. Hydrobiol., Suppl. 33:1-62, 44 figs., 10 tables.

Strenger, A.

- [45] -1970. Zur Kopfmorphologie der Ephemeridenlarven Palingenia longicauda. Zoologica, 41(117):1-26, 21 figs.

Thomas, A. & R. Sowa

- [46] -1970. Ecdyonurus macani n. sp., espèce européenne voisine d'E. torrentis Kimmins (Ephemeroptera, Heptageniidae). Ann. Limnol., 6: 75-85, 15 figs.

Thomas, E.

- [47] -1969. Zur Tagesperiodik des Schlüpfens von Ephemeropteren und Plecopteren. Oecologia (Berl.), 3:230-239, 9 figs.
[48] -1970. Die Oberflächendrift im Kaltisjokk. Österreichs Fisch., 23: 101-110, 8 figs.

Thorup, J.

- [49] -1970. The influence of a short-termed flood on a springbrook community. Arch. Hydrobiol., 66:447-457, 4 figs., 1 table.

Ueno, M.

- [50] -1969. Mayflies (Ephemeroptera) from various regions of Southeast Asia. Oriental Insects, 3:221-238, 77 figs.

Werner, E. & H. Werner

- [51] -1968. Ephemeroptera, Plecoptera, Trichoptera und Coleoptera vom Geisbach bei Bad Hersfeld. Gewässer u. Abwässer, 47:20-30, 2 figs., 3 tables.

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EATONIA INDEX

compiled by Janice G. Peters

The numbers in brackets refer to paper numbers listed in the Recent Ephemeroptera Literature. When we have not seen the paper that is cited, we can only repeat information published elsewhere. We would appreciate any additions or corrections in order to make Eatonia Index as complete and accurate a record as possible.

TAXONOMY

BAETIDAE

Baetis aculeatus Navas (declared nomen dubium) Müller-Liebenau [1970(1969)] [36] p. 187, 190.

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Baetis andalusicus Navas (declared nomen dubium) Müller-Liebenau [1970(1969)] [36] p. 187.

Baetis atrebatinus Eaton (redescription) Müller-Liebenau [1970(1969)] [36] p. 150

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- Baetis gemellus Eaton (nymph;
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- Baetis gracilis Bogoescu &
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- Baetis lapponicus (Bengtsson)
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- Baetis longinervis Navas (declared
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- Baetis lutheri Müller-Liebenau
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[36] p. 65.
- Baetis macani Kimmins (redescription)
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[1970(1969)] [36] p. 112.
- Baetis melanonyx (Pictet) (= B.
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[36] p. 58.
- Baetis meridionalis Ikonomov
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- Baetis neglectus Navas (declared
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- Baetis niger (Linné) (= B. incurvus
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Baetis tricolor Tshernova
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Baetis sp. nympha vardarensis
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Baetis vernus Curtis (= B. tenax
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Hexagenia subgenus Pseudeatonica
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Ecdyonurus macani sp. n. (male
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SEE genus Thraulius
- Masharikella duliti (Demoulin)
SEE Thraulius duliti
- Masharikella fasciata (Kimmins)
SEE Thraulius fasciatus
- Masharikella semicastanea (Gillies)
SEE Thraulius semicastanea
- Masharikella torrentis Gillies
SEE Thraulius torrentis
- Masharikella turbinatus (Ulmer)
SEE Thraulius turbinatus
- Genus Megaglena gen. n. Peters & Edmunds (1970) [39] p. 210.
- Megaglena brincki sp. n. (male & female imagos, nymph; Ceylon)
Peters & Edmunds (1970) [39] p. 211.
- Genus Nathanelia Demoulin
(nymph) Peters & Edmunds (1970) [39] p. 212.
- Genus Notophlebia gen. n. Peters & Edmunds (1970) [39] p. 213.
- Notophlebia hyalina sp. n. (male imago; Madras, India) Peters & Edmunds (1970) [39] p. 213.

Simothraulius seminiger Ulmer
(nymph) Demoulin (1969)
[12] p. 239.

Genus Thraulius Eaton (= genus
Masharikella Peters, Gillies &
Edmunds syn. n.) Peters &
Edmunds (1970) [39] p. 203.

Thraulius duliti (Demoulin) (nymph
described in Masharikella)
Demoulin (1969) [12] p. 233.
(transferred from genus
Masharikella) Peters & Edmunds
(1970) [39] p. 203.

Thraulius fasciatus (Kimmins)
(transferred from genus
Masharikella) Peters & Edmunds
(1970) [39] p. 203.

Thraulius hindustanicus Gillies
SEE Gilliesia hindustanica

Thraulius pacificola sp. n. (female
subimago; Bismarck Islands)
Demoulin (1969) [12] p. 234.

Thraulius semicastanea (Gillies)
(transferred from genus
Masharikella) Peters & Edmunds
(1970) [39] p. 203.

Thraulius signatus (Hagen)
SEE Choroterpes (Euthraulius)
signata

Thraulius torrentis (Gillies)
(transferred from genus
Masharikella) Peters & Edmunds
(1970) [39] p. 203.

Thraulius turbinatus (Ulmer)
(transferred from genus
Masharikella) Peters & Edmunds
(1970) [39] p. 203.

OLIGONEURIIDAE

Lachlania dencyanna sp. n. (male &
female imagos, nymph; New Mexico,
USA) Koss in Koss & Edmunds
(1970) [28] p. 55.

POTAMANTHIDAE

Potamanthodes formosus (Eaton)
[= Potamanthus (Potamanthodes)
kamonis Imanishi syn. n.]
Ueno (1969) [50] p. 232.

Potamanthus (Potamanthodes)
kamonis Imanishi
SEE Potamanthodes formosus

FOSSIL EPHEMEROPTERA

Family HEXAGENITIDAE (= family
Paedephemeridae syn. n.)
Demoulin (1970) [14] p. 1.

Genus Hexagenites Scudder
(= genus Paedephemera Handlirsch
syn. n.) Demoulin (1970) [14]
p. 5.

Hexagenites celluloso (Hagen)
[transferred from genus
Paedephemera; = Hexagenites
weyenbergeri Scudder syn. n.;
= Paedephemera mortua (Hagen)
syn. n.; = P. multinervosa
(Oppenheim) syn. n., redescription
of holotype; = P. oppen-
heimi Handlirsch syn. n.]
Demoulin (1970) [14] p. 5.

ISONYCHIIDAE, Coloburiscinae

Genus Siphurites Cockerell
(transferred from family
Siphonuridae) Demoulin
(1970) [15] p. 2.

Siphurites explanatus Cockerell
(redescription of holotype)
Demoulin (1970) [15] p. 1.

LEPTOPHLEBIIDAE

Genus Oligophlebia Demoulin
SEE genus Paraleptophlebia

Oligophlebia calliarcys Demoulin
SEE Paraleptophlebia prisca

Oligophlebia longiceps Demoulin
SEE Paraleptophlebia prisca

Genus Paraleptophlebia Lestage
(= genus Oligophlebia Demoulin
syn. n.) Demoulin (1970) [13]
p. 7.

Paraleptophlebia prisca (Pictet)
(= Oligophlebia calliarcys
Demoulin syn. n.; = O. longiceps
Demoulin syn. n.) Demoulin
(1970) [13] p. 9.

Family PAEDEPHEMERIDAE
SEE Family Hexagenitidae

Genus Paedephemera Handlirsch
SEE genus Hexagenites

Paedephemera cellulosa (Hagen)
SEE Hexagenites cellulosa

Paedephemera mortua (Hagen)
SEE Hexagenites cellulosa

Paedephemera multinervosa
(Oppenheim)
SEE Hexagenites cellulosa

Paedephemera oppenheimi Handlirsch
SEE Hexagenites cellulosa

Paedephemera schwertschlageri
Handlirsch
SEE Oligisca schwertschlageri

Paedephemera weyenbergeri (Scudder)
SEE Hexagenites cellulosa

SIPHONURIDAE

Genus Oligisca gen. n. Demoulin
(1970) [14] p. 6.

Oligisca schwertschlageri
(Handlirsch) (transferred from
genus Paedephemera; redescription
of holotype) Demoulin
(1970) [14] p. 4, 6.

Genus Siphurites Cockerell
SEE Family Isonychiidae, genus
Siphurites

OTHER TAXONOMY

Comments on American genera of the
Oligoneuriidae and wing venation
of Lachlania. Koss &
Edmunds (1970) [28].

Keys to and descriptions of all
European species of the genus
Baetis. Müller-Liebenau
[1970(1969)] [36].

Revision of the key to the European
species of the genus Ecdyonurus.
Thomas & Sowa (1970) [46].

Keys to and descriptions of all
Eastern Hemisphere genera of the
Leptophlebiidae. Peters &
Edmunds (1970) [39].

Illustrated adult and nymphal keys
to the superfamilies, families,
and subfamilies of Australian
Ephemeroptera. Short discussions
are given on their generic
characteristics, biology and
distribution. Riek (1970) [42].

BEHAVIOR

Comparison of drift of Ephemeroptera,
Plecoptera and Simuliidae in
Middle and Northern European
streams. Drift is 6 times greater
in Middle Europe than in Northern
Europe. In Middle Europe there
is one period of maximum drift
but two periods of maximum drift
occur in Northern Europe. Müller
(1970) [35].

Field study of hourly subimago
emergence patterns and imago
activity of Leptophlebia marginata,
Centroptilum luteolum, Ephemera
janica, Ephemerella ignita, and
one stonefly (Nemoura cinerea) on
Lake Mondsee, Austria. Thomas
(1969) [47].

Surface drift of Ephemeroptera,
Plecoptera and Trichoptera in the
Kaltisjokk River, Sweden. Daily
and hourly patterns of emergence
of subimagos and ovoposition
flight of Baetis pumilus, B.

rhodani, B. macani and B. subalpinus are given. Thomas (1970) [48].

Downstream drift and diurnal activity of Ephemeroptera (Anagenesia paradoxa, Oligoneuriella sp., Baetis sp., and Polymitarcys nigridorsum), Plecoptera and Trichoptera in the Amur River, USSR. Kljutschareva (1963) [27].

Significant correlations are found between diel drift of aquatic invertebrates and the stomach contents of trout in England. Elliott (1970) [16].

BIOLOGY AND LIFE HISTORIES

Life cycle of nymphs of Rhithrogena morrisoni (Banks) in Oregon, USA. Lehmkuhl (1970) [30]

Daily and hourly emergence records for subimagos and flight activity of imagos of Leptophlebia marginata, Ephemera danica, Centroptilum luteolum and Ephemerella ignita are given. The duration of the subimaginal stage of Leptophlebia marginata is significantly correlated with temperature. Similar results are obtained for Ephemerella ignita. Thomas (1969) [47].

Daily and hourly patterns of sub-imago emergence and oviposition flight of females of Baetis pumilus, B. rhodani, B. macani and B. subalpinus in Sweden are given. Thomas (1970) [48].

Swarm behavior of Lachlania dencyanna sp. n. Koss & Edmunds (1970) [28].

Imaginal flight period for Ephemeroptera species on the Geisbach River, Germany (DBR). Werner & Werner (1968) [51].

Statistical analyses of variability of 6 linear measurements (length of head, mesonotum, total body, and width of pronotum, mesonotum, and abdomen) in the life cycle of Leptophlebia cupida. Sexual variations occur. For females the least variable measurements are head length and pronotum width. Head length and abdomen width vary least in males. Body length remains a useful measure when sexes are treated together. Clifford (1970) [10].

Procedure and equipment for rearing eggs and young larvae of aquatic insects. Bjarnov & Thorup (1970) [8].

ECOLOGY

A study of invertebrates living in the hyporheal environment of stones, gravel and sand below the stream bed, Germany (DBR). Schwoerbel (1964) [43].

Field experimental study of invertebrates in the interstitial spaces between sand and gravel on the banks of a stream in Germany (DBR). A large population of invertebrates lives in the damp pores between gravel. Habroleptoides modesta nymphs are found 50 cm. and more away from the water's edge, but do not occur near the stream. Eggs hatch in the stream and young nymphs later move into the interstices (with high humidity) away from the edges of the water. Schwoerbel (1967) [44].

Field study of the effects of a flood on relative frequency and relative abundance of invertebrate species in a Danish springbrook. Baetis rhodani and most other invertebrates were not seriously affected. Populations of all but two of the invertebrates studied returned to normal levels in few months. Thorup (1970) [49].

Ecological groups of Ephemeroptera, Plecoptera and Trichoptera of the Kamchatka Peninsula, USSR. The largest group is tachypotamophilous, occurring in rapid streams and rivers in the foothills. Levanidova (1970) [31].

Experimental study evaluating sugar solution flotation technique for obtaining live invertebrates from ooze of lake bottoms, Poland. Kajak, Dusoge & Prejs (1968) [24].

EVOLUTION AND PHYLOGENY

Phylogeny of the Eastern Hemisphere genera of the Leptophlebiidae. Peters & Edmunds (1970) [39].

FAUNAL STUDIES - geographical

Insects, including species of Ephemeroptera, from Craters of the Moon National Monument, Idaho, USA. Horning & Barr (1970) [21].

Ephemeroptera among insects collected in light traps in southern Florida, USA. Frost (1970) [18].

New Ephemeroptera records from Goeree-Overflakkee Island, Netherlands. Geijskes (1969) [20].

Centroptilum sp. from mountains of Madeira. Classey (1966) [9].

Ephemeroptera among insects collected in light traps in Punjab, India. Atwal, Chaudhary & Ramzan (1969) [6].

Ephemeroptera species from the Philippine Islands and the Bismarck Islands. Demoulin (1969) [12].

New species records of Ephemeroptera from the Ryukyu Islands. Ueno (1969) [50].

Distribution of Australian genera of Ephemeroptera. Riek (1970) [42].

FAUNAL STUDIES - limnological

Ephemeroptera species from the Green River, Utah, USA. Pearson, Kramer & Franklin (1968) [38].

Caenis and Hexagenia among macroinvertebrates of Boomer Lake, Oklahoma, USA. Craven & Brown (1969) [11].

Ephemeroptera species of the Gapeau River, southern France. Keiner & Ollier (1970) [26].

Ephemeroptera of the Geisbach River, Germany (DBR). Werner & Werner (1968) [51].

Ephemeroptera of the source area of the Lisinski Potok, Yugoslavia. Filipović (1966) [17].

Ephemeroptera of the Kamchatka Peninsula, USSR. Levanidova (1970) [31].

HYDROBIOLOGY

Comparison of macroinvertebrates in the Green River, Utah, USA, before and after impoundment. Temperature changes have severely affected populations below the dam and some effects continue as much as 150 km. downstream. Pearson, Kramer & Franklin (1968) [38].

Comparison of Ekman, Ponar, and orange-peel dredges for bottom sampling. The Ponar dredge was found to be most versatile, and

- the Ekman was useful in many situations. Hudson (1970) [22].
- Description of topographical, geographical, and physico-chemical conditions of the Gapeau, a Mediterranean coastal stream in France. A complete flora and fauna list is given. The biozonation of the stream is discussed. Keiner & Ollier (1970) [26].
- Discussion of biozonation of the Geisbach River, Germany (DBR). Werner & Werner (1968) [51].
- Hydrobiological, physico-chemical and geomorphological study of the Somesul Cald River, Hungary. The three main zoocoenoses are those of moss, periphyton, and the litho-rheophilous fauna. Among the Ephemeroptera were Ecdyonurus lateralis, Ephemera ignita, and Torleya major. Prunescu-Arion & Baltac (1967) [41].
- Description of physiographical, physical, and chemical properties of the source area of the Lisinski Potok brook on Kopaonik Mt., Yugoslavia. Aquatic insect communities are studied. Dominant Ephemeroptera are Baetis carpatica and Ecdyonurus venosus. Filipović (1966) [17].
- Descriptions of types of streams and their biomass on the Kamchatka Peninsula, USSR. Biomass is highest on large rocks in the current and lowest in sandy sections of lowland rivers. Major components of the benthos are Chironomidae, Ephemeroptera and Plecoptera. Isopods are absent. Levanidova & Kokhmenko (1970) [32].
- Productivity of a pond on New Gordon College Campus, Pakistan, and suggestions for reducing pollution. Ali (1966) [1].
- Comparison of bottom faunas and productivity of streams in the Hazara District of Pakistan. Ali (1968) [2].
- Comparison of bottom faunas and productivity of streams in Kohat District and Kurram Agency, Pakistan. Ali (1968) [3].
- Bottom fauna and productivity of the Korang Stream, Rawalpindi, Pakistan. Productivity is high in areas where the gradient of the stream is low. It is suggested that dams and deflectors be constructed to slow the flow of water and increase productivity. Ali (1968) [4].
- Effects of rain on bottom fauna and productivity of streams in Rawalpindi and Wah, Pakistan. To reduce loss of bottom fauna by flooding, dams and deflectors should be constructed. Ali (1969) [5].
- MORPHOLOGY AND PHYSIOLOGY
- Functional morphology of muscles and exoskeleton of the head of Palingenia longicauda. Strenger (1970) [45].
- Description of the spermatozoon of Cloeon dipterum and comments on its primitive and aberrant characters. Baccetti, Dallai & Giusti (1969) [7].
- Sperm flagella of Pentagenia vittigera, Hexagenia sp. and Tricorythodes sp. Phillips (1969) [40].

Laboratory comparison of methods of measuring respiration using Cloeon dipterum and two other invertebrates. Results using a closed bottle technique varied depending on the length of time of exposure. Results using a flowing water respirometer were independent of time. Kamler (1969) [25].

PARASITES AND SYMBIOTIC ASSOCIATES

Life cycle of the trematode, Omphalometra flexuosa, and a review of its intermediate hosts. Cloeon dipterum nymphs and adults serve as hosts for the metacercariae. Odening (1969) [37].

New intermediate host records for the nematode, Tetrameres fissispina, include nymphs of the Ephemeroptera species, Cloeon dipterum and Ordella macrura. Garkavi (1965) [19].

Description of female of Simulium (Phoretomyia) berneri and comments on the Simuliidae phoretic associates of Ephemeroptera in West Cameroon. Lewis, Disney & Crosskey [1969(1968)] [33].

REVIEWS

Discussion of the effects of watershed management on the ecology of aquatic life. Hynes (1970) [23].

Discussion of biological problems encountered after impoundment of Lake Volta in Ghana. Flooded trees have provided a substratum for Povilla leading to an increase in the population of insectivorous fish. Other problems are also summarized. Lawson (1970) [29].

ZOOGEOGRAPHY

Zoogeography of Ephemeroptera, Plecoptera and Trichoptera of the Kamchatka Peninsula, USSR. The greater part of the fauna is Holarctic, Palearctic or Eastern Palearctic in nature and is viewed as a derivative of an ancient Angara fauna. Another part of the fauna consists of species endemic to Kamchatka and the Pacific islands which are considered as remnants from the former Bering land bridge. Levanidova (1970) [31].

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